IS 10933 (1984): Myristic Acid [FAD 13: Oils and Oilseeds]

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Indian Standard

SPECIFICATION FOR MYRISTIC ACID

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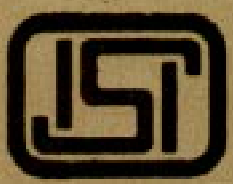

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

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SPECIFICATION FOR MYRISTIC ACID

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Indian Standard

SPECIFICATION FOR MYRISTIC ACID

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 30 March 1984, after the draft finalized by the Oils and Oilseeds Sectional Committee had been approved by the Chemical Division Council and the Agricultural and Food Products Division Council.

0.2 Myristic acid is a saturated fatty acid having 14 carbon atoms. Its molecular formula is $CH_3 (CH_2)_{12} COOH$ with 228·4 as its molecular weight. It is a crystalline solid with a faint characteristic fatty odour. It is a major fatty acid of nutmeg butter and khakhan fat (*Salvadora oleoides Decne*). It is present to the extent of 17 percent in coconut (*Cocos nucifera Linn.*), palm kernel (*Elaeis guineensis Jacq.*) and babassu (*Orbignya martiana, O. oleifera* or *O. speciosa*) oils. Commercially, myristic acid is obtained by fractional distillation of coconut, palm kernel and babassu oil fatty acids. By repeated fractionation steps, myristic acid of 99 percent purity can be made.

0.3 The major use of myristic acid is in cosmetics like shaving cream, shampoos, etc. A sizable quantity is used for making isopropyl myristate, which is an important ingredient in cosmetics.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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1. SCOPE

1.1 This standard prescribes the requirements and the methods of sampling and test for myristic acid.

*Rules for rounding off numerical values (*revised*).

2. GRADES

2.1 The material shall be of three grades, namely, Grade 1, Grade 2 and Grade 3.

3. REQUIREMENTS

3.1 Description — Myristic acid shall be the product obtained by splitting myristic acid rich oils, like coconut, palm kernel, and babassu oil and fractionating the fatty acids suitably. Myristic acid may also contain minor proportions of C_{10}—C_{18} fatty acids.

3.2 The material shall also comply with the requirements given in Table 1.

TABLE 1 REQUIREMENTS FOR MYRISTIC ACID

(*Clauses* 3.2 *and* 6.1)

Sl No.	Characteristic	Requirements for			Method of Test, Ref to		
		Grade 1	Grade 2	Grade 3	Cl. No. in IS : 548 (Part 1)-1964*	Appendix	Indian Standard
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
i)	Myristic acid, percent by mass, *Min*	99·0	90·0	70·0	—	—	IS : 548 (Part 3)-1976†
ii)	Moisture, percent by mass, *Max*	0·1	0·15	0·35	5.2	—	—
iii)	Saponification value	245-247	243-249	240-250	15	—	—
iv)	Acid value shall not differ from saponification value by more than	4	4	4	7	—	—
v)	Iodine value, *Max*	0·2	1·0	1·0	14	—	—
vi)	Mineral acidity	Nil	Nil	Nil	—	A-1	—
vii)	Ash, percent by mass, *Max*	0·01	0·01	0·02	—	A-2	—
viii)	Unsaponifiable matter percent by mass, *Max*	0·1	0·1	0·2	8	—	—
ix)	Titre	52·5-54	48-53	46-53	12	—	—
x)	Colour, 5¼—in cell, Y+5 R, *Max*	2	5	10	13	—	—

*Method of sampling and test of oils and fats: Part 1 Methods of sampling, physical and chemical tests (*revised*).

†Methods of sampling and test of oils and fats: Part 3 Analysis by gas liquid chromatography.

4. PACKING AND MARKING

4.1 Packing — The material shall be supplied in suitable containers, as agreed to between the purchaser and the supplier.

4.2 Marking — The containers shall be securely closed and legibly and indelibly marked with the following information:

a) Manufacturer's name and recognized trade-mark, if any;

b) Name and grade of the material;

c) Net mass of the material;

d) Batch number or lot number in code or otherwise; and

e) Month and year of manufacture.

4.2.1 The containers may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

5. SAMPLING

5.1 Representative samples of the material shall be drawn and conformity of the material to the requirements of this specification shall be determined according to the procedure prescribed in Appendix B.

6. TESTS

6.1 Tests shall be carried out by the methods prescribed in **6** of Table 1 and in Appendix A.

APPENDIX A

[*Table* 1, *items* (vi) *and* (vii)]

TEST FOR MINERAL ACIDITY AND ASH

A-1. TEST FOR MINERAL ACIDITY

A-1.1 Quality of Reagents — Unless specified otherwise, pure

chemicals and distilled water (*see* IS : 1070-1977*) shall be employed in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the result of analysis.

A-1.2 Reagents

A-1.2.1 *Methyl Orange Indicator* — 0·05 percent (*w/v*) solution.

A-1.2.2 *Light Petroleum Ether* (60°C/80°C).

A-1.3 Procedure — Measure 10 ml of the melted sample into a separating funnel and shake intimately with three successive 10 ml portions of hot water. The temperature of the hot water should be more than the melting point of myristic acid. Combine the aqueous extracts, transfer to another separating funnel and remove traces of fatty acids in the water by extraction with light petroleum ether. Test the aqueous extract so obtained with a few drops of methyl orange indicator.

A-1.4 The material shall be taken to have satisfied the requirements of the test if the indicator does not show acid reaction.

A-2. DETERMINATION OF ASH

A-2.1 Apparatus

A-2.1.1 *Platinum Crucible*

A-2.1.2 *Desiccator* — cantaining an efficient desiccant, such as fused calcium chloride.

A-2.2 Procedure — Weigh accurately about 10 g of the air-dried material into a platinum crucible which has been previously dried, cooled in the desiccator and weighed. Heat the crucible over a low flame and ignite the contents gently. Incinerate the residue in a muffle furnace at 550° ± 10°C until free from carbon. Cool the crucible in a desiccator and weigh. Repeat the above procedure of heating, cooling and weighing until the difference between two successive weighings does not exceed 1 mg.

A-2.3 Calculation

$$\text{Ash, percent by mass} = \frac{100\ m}{M}$$

where

m = mass in g of the ash, and

M = mass in g of the material taken for the test.

*Specification for water for general laboratory use (*second revision*).

APPENDIX B

(*Clause* 5.1)

SAMPLING OF MYRISTIC ACID

B-1. GENERAL REQUIREMENTS OF SAMPLING

B-1.0 In drawing, preparing, storing and handling test samples, the following precautions and directions shall be observed.

B-1.1 Samples shall not be taken in an exposed place.

B-1.2 The sampling instrument shall be clean and dry when used.

B-1.3 Precautions shall be taken to protect the samples, the material being sampled, the sampling instrument and the containers for samples from adventitious contamination.

B-1.4 To draw a representative sample, the contents of each container selected for sampling shall be mixed as thoroughly as possible by suitable means.

B-1.5 The samples shall be placed in clean, dry glass stoppered bottles.

B-1.6 The sample containers shall be of such a size that they are almost completely filled by the sample.

B-1.7 Each sample container shall be sealed air-tight after filling and marked with full details of sampling, the date of sampling and the year and month of manufacture of the material.

B-1.8 Samples shall be stored in such a manner that the temperature of the material does not vary unduly from the normal temperature.

B-2 SCALE OF SAMPLING

B-2.0 Samples to determine conformity of the material to this specification shall be selected in accordance with the procedure given below. However, the purchaser and the supplier may agree to adopt any other procedure.

B-2.1 Lot — All the containers in a single consignment of one grade of the material drawn from a single batch of manufacture shall constitute the lot. If a consignment is declared to consist of different batches of manufacture, the batches shall be marked separately and the groups of containers in each batch shall constitute separate lots.

B-2.2 The number of containers to be selected from a lot shall depend upon the size of the lot and shall be in accordance with col 1 and 2 of Table 2.

TABLE 2 NUMBER OF CONTAINERS TO BE SELECTED FROM VARIOUS SIZES OF LOTS

LOT SIZE	NUMBER OF CONTAINERS TO BE SELECTED
N	n
(1)	(2)
Up to 5	All (*see* Note)
6 to 65	5
66 to 110	7
Over 110	10

NOTE — When the lot size is 5 or less, the test results of each of the samples shall meet the corresponding requirement.

B-2.3 These containers shall be selected at random from the lot. In order to ensure the randomness of selection, procedures given in IS : 4905-1968* may be followed.

B-3. TEST SAMPLES AND REFEREE SAMPLE

B-3.1 Draw with an appropriate sampling instrument small portions of the material from different parts of the selected containers, the total quantity being sufficient to carry out the tests for all characteristics given in Table 1.

B-3.2 Mix thoroughly all portions of the material drawn from the same container to form an individual sample to represent the container. Equal quantities from the selected containers shall be mixed together to form a composite sample to represent the lot.

B-3.3 All the individual samples representing the selected containers and the composite sample representing the lot shall be divided into three equal parts, thus forming three sets of test samples. These parts shall be immediately transferred to thoroughly dried bottles which shall then be sealed air-tight with glass stoppers. These shall be labelled with all the particulars of sampling given in **B-1.7**. One set of the test samples shall be sent to the purchaser and one to the supplier.

*Methods of random sampling.

B-3.4 Referee Sample — The third set of the test samples, bearing the seals of the purchaser and the supplier, shall constitute the referee sample and shall be used in case of dispute between the purchaser and the supplier. It shall be kept at a place agreed to between the purchaser and the supplier.

B-4. NUMBER OF TESTS

B-4.1 The tests for saponification value, acid value and titre (*see* Table 1) shall be carried out on each individual sample of the set of test samples (*see* **B-3.3**).

B-4.2 The tests for the remaining characteristics given in Table 1 shall be carried out on the composite sample of the set of test samples (*see* **B-3.3**).

B-5. CRITERION FOR CONFORMITY

B-5.1 A lot shall be considered as conforming to this specification if it satisfies the criteria in **B-5.2.1** and **B-5.3** for the characteristics given in Table 1.

B-5.2 The test results for saponification value, acid value and titre shall be recorded as shown in Table 3. The mean and the range shall be calculated as follows and shall be recorded in col 4 and 5 respectively of Table 3:

$$\text{Mean } (\bar{X}) = \frac{\text{The sum of the test results}}{\text{Number of test results}}$$

$$\text{Range (R)} = \text{The difference between the maximum and the minimum values of the test results}$$

B-5.2.1 The corrected mean as shown in col 6 of Table 3 shall be calculated. The lot shall be considered to have satisfied the requirement for a characteristic if the condition given in col 7 of Table 3 is satisfied.

B-5.3 The composite sample when tested for the remaining characteristics not tests in **B-5.2** shall satisfy the corresponding requirements for them as specified in Table 1.

TABLE 3 CRITERION FOR CONFORMITY

(*Clauses* B-5.2 *and* B-5.2.1)

Sl No.	Characteristic	Test Results 1, 2, 3...	Mean	Range	Corrected Mean	Criterion for Conformity
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	Saponification value		$\bar{X}_1$	R_1	$\bar{X}_1 - 0{\cdot}6\ R_1$	Corrected mean $\geq$ specified value in Table 1 (ii)
ii)	Acid value		$\bar{X}_2$	R_2	$\bar{X}_2 - 0{\cdot}6\ R_2$	Corrected mean $\geq$ specified value in Table 1 (iii)
iii)	Titre		$\bar{X}_3$	R_3	$\bar{X}_3 - 0{\cdot}6\ R_3$	Corrected mean $\leq$ specified value in Table 1 (viii)

(*Continued from page* 2)

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INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

Quantity	Unit	Symbol
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

Quantity	Unit	Symbol
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

Quantity	Unit	Symbol	Definition
Force	newton	N	1 N = 1 $kg.m/s^2$
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m^2
Frequency	hertz	Hz	1 Hz = 1 c/s (s^{-1})
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress,	pascal	Pa	1 Pa = 1 N/m^2